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ABSTRACT

Thinking skills instruction involves both the mastery of skills and the development of dispositions, habits of thought, and interpersonal behavior. Schools incorporate thinking skills programs into their programs to achieve two basic goals. The first goal is the development of autonomous thinkers. The liberal tradition in American education takes this as fundamental, and with such a goal in mind students are given the instruments needed to generate and evaluate ideas. Within this context, instruction focuses on education for citizenship, decision making, and lifelong learning. The second goal is to strengthen educational programs. Such programs focus on enrichment, remediation, and metacognition. Thinking skills programs are either presented as a separate course or unit of instruction, or they are infused into the standard school curriculum. Teaching for thinking requires teachers to adopt certain pedagogical practices and to master essential concepts and skills, including open-mindedness, flexibility, a commitment to objective standards for evaluation, and skill in managing discussions. Teaching for thinking involves helping students to develop logical principles of thought and to be aware of the underlying abstractions that are implicit in the concrete discussion at hand, and to utilize them throughout their learning. In contrast to traditional teaching objectives, teaching for thinking involves an emphasis on divergent rather than convergent thinking, spiral as opposed to linear thinking, reasoned judgment rather than fact and opinion, and equality between teacher and student. References are included. (IAH)

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Integrating Thinking Skills Into the Schools

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The Institute for Critical Thinking at Montclair State College is designed to support and enrich faculty development efforts toward critical thinking as an educational goal. Guided by a National Advisory Board and a College Advisory Council, its primary purpose is to serve as a catalyst in the development of educational excellence across the curriculum at the College. A collaborative, multi-disciplinary approach is in process, with attention to the study of both the theoretical aspects of critical thinking across the disciplines and their implications for teaching and learning at the college level. Leadership roles have also been assumed in helping other colleges and schools to incorporate critical thinking into their curricula.

As part of this effort, the Institute for Critical Thinking publishes a newsletter, *Critical Thinking: Inquiry Across the Disciplines*, on a monthly basis during the academic year. The newsletter publishes information about the activities of the Institute, as well as brief analyses of various critical thinking issues. In addition, the publication of several series of resource documents are in process. These publications will make available, to interested faculty and others at Montclair and elsewhere, working papers related to critical thinking as an educational goal. These publications will enable those persons interested in critical thinking to have access to more extensive discussions of the kinds of issues that can only be presented in summary form in the newsletter. These discussions will typically be regarded as works-in-progress--articles written as tentative arguments inviting response from others, articles awaiting the long publication delay in journals, etc. The proceedings of our conferences will also be presented in the form of resource publications, as will articles based on our series of lectures, inquiry panels, and faculty seminars and forums.

In this first series of resource publications, we have included working papers by members and guests of our Institute Fellows "Round Table." Most of these working papers have been presented for discussion at one or more of the Fellows' seminar meetings, and have influenced our thinking about the nature of critical thinking as an educational goal.

The Institute welcomes suggestions for our resource publication series, as well as for our other activities. Correspondence may be addressed to us at

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INTEGRATING THINKING SKILLS INTO THE SCHOOLS

Mark Weinstein

This paper is an overview of issues typical of attempts to integrate thinking skills instruction into the classroom. A variety of concerns will be presented, including conceptual, pedagogical and practical aspects of thinking skills instruction. Whatever the focus, central issues will be viewed in terms of the context of implementation. The paper attempts to address the immediate concerns of schools, concerns that typically arise when attempting to make decisions as to the design of projected thinking skills instruction. Because of the breadth of the topics considered, the discussion will be preliminary. Topics will be briefly characterized rather than discussed in depth. The paper can, therefore, be seen as an attempt to offer a logical skeleton that can be used as a basis of further study and discussion, through the literature and through the concrete development of programs in the schools.

We will not attempt to define thinking skills. Rather we will accept the variety of approaches that constitute contemporary practice (Costa, 1985). We will, however, follow Ennis (1985) in maintaining that teaching for thinking involves both the mastery of skills and the development of dispositions, habits of thought and of interpersonal behavior. Many of the issues we discuss arise because of the difficulties inherent to a complex of abilities and attitudes. It is not enough to offer students tools for thinking, whether as a series of facts about logic or even as a set of heuristics. Students must be motivated to see the relevance of higher order cognitive skills and be helped to apply them in many and varied situations. Alternatively, it is not sufficient to generate a classroom context where openness and discussion is the norm. Students must be helped to understand and correctly apply the criteria that determine logical, epistemological and value appropriateness.

Goals of a Thinking Skills Program

Thinking skills programs are incorporated into the schools for a variety of reasons. There are two basic kinds of goals, each of which has a number of typical variations.

1. Developing autonomous thinkers

The liberal tradition in American education (Paul, 1985), and especially progressive educators (Dewey, 1945) take the development of autonomous thinkers as the most fundamental goal of education (Siegel, 1980). With such a goal in mind students are given the instruments necessary for them to generate and evaluate ideas. This capability is usually thought of as being manifested in two regards.

a. Education for citizenship

Students are helped to understand the concepts and procedures basic to a participatory democracy (Glazer, 1985; Paul, 1984). This can be accomplished through guided practice in school and classroom governance, or by means of the critical exploration of contemporary and historical issues of social and political importance. The application of a thinking skills perspective within this area is prompted by the need for more cogent standards for political decision making, as well as the naturalness with which thinking skills strategies can develop through such participation and exploration (Kurfman and Cassidy, 1977).

b. Decision making

The general ability to evaluate competing claims and goals is frequently presented by exploring issues central to the concerns of students. Contemporary issues like the use of drugs and teenage pregnancy are possible focuses (Scriven, 1980). Less dramatic, but equally serious matters, such as careers and college choice can also be used in this regard. Matters of health and hygiene, as well as consumer education are available contexts for fostering students' decision making skills. Issues that overlap these two domains, community and school problems are frequently included as well.

c. Lifelong learning

The accelerated rate of social and intellectual change that has characterized recent decades has prompted social commentators and educators to reconceptualize the central objectives of education (Nisbitt, 1984; National Commission, 1983). Previous educational practice, it is maintained, addressed the need to inculcate traditional knowledge and to prepare students for employment that was fundamentally similar to that of the generation that preceded them. The rapid pace of advance and the resulting uncertainty of the intellectual and professional demands that would have to be addressed by today's students, requires that students learn, not merely information and skills, but the art of learning itself. Education for the "21st century" requires that students be prepared to unlearn the specifics of their previous education, and apply themselves to whatever new and unforeseen concepts and skills emerge (National Science Board, 1983). Such an ability requires that students see past the surface of their education and internalize the procedures that make new learning possible. This requires thoughtful appreciation of learning itself, that is, learning must be seen as a generalizable skill and as a desirable process, one that will continue for the students' lifetime. Thinking skills are deemed central to this process (National Commission, 1983).

2. Strengthening educational programs

The other main locus for defining the goals of thinking skills education involves the particulars of academic achievement. Reasoning has often been characterized as 'the fourth R' (Bossone, 1983). Thinking is seen as a general ability applicable throughout schooling. Extending educational programs to effectively engage the student in the development of higher cognitive skills is among the most typical motives for incorporating thinking skills into the curriculum. This, in part, resulted from dissatisfaction with outcomes associated with the recent emphasis on basic skills. Although strengthening basic skills was reasonably successful in helping students to be more effective in such fundamental abilities as decoding and calculation, it was realized that although these abilities are necessary they are not sufficient for educational excellence. The application of higher order tasks, inferential reading and problem solving in mathematics, required a further level of educational engagement (National Assessment, 1981; National Council, 1980). Similarly, the use of mathematics in science contexts, the ability to design and evaluate experiments and the synthesis of information in projects and reports, required that both social studies and natural science offer more sophisticated strategies than recall and elementary information management techniques (National Science Board 1983).

This perspective is consistent with the development of autonomous thinkers. Strength in achievement as reflected by academic success in school subjects is, hopefullly, relevant to autonomy of thought. Thinking skills approaches whose focus is on strengthening educational programs do, however, have a particular profile and can be organized into characteristic types.

a. Enrichment

The need to extend educational programs to effectively engage the student in the development of higher cognitive skills is among the most typical of the motivations behind the incorporation of thinking skills into the curriculum. Initially emphasized in programs for the gifted, tasks requiring higher cognitive skills were frequently included as a device to extend instruction beyond the workbook based approach common in the basic skills movement (Renzulli, 1977). Information and skills, once mastered, are applied to tasks that required synthesis and creativity. Such projects were frequently student selected and self-defined, requiring all of the traditional higher cognitive objectives including evaluation (Bloom, et. al., 1956).

b. Remediation

Parallel to the concern with the gifted, the concern with the educationally deprived forms another focus for thinking skills instruction. Basic cognitive abilities like attending, restating and organizing information have been operationalized in programs that help students to compensate for fundamental deficiencies (Feuerstein, et. al., 1980). Such

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programs, frequently different in appearance from approaches characteristic of gifted education, are appropriately considered as engaged in the development of thinking skills in so far as they isolate and identify general aspects of cognitive processing. Such programs generally require the use of special materials specifically designed for the development of basic cognitive skills. Characteristically, they have a clear theoretic base in cognitive psychology. Remediation approaches to thinking skills offer the child an increased awareness of the procedures that must be followed to process information. This self awareness, metacognition, constitutes a basic approach to thinking skills instruction (Costa, 1985a).

c. Metacognition

The interest in student awareness and control of the various procedures involved in processing information antedates the recent interest in thinking skills (O'Neil, 1978). The analysis and direct teaching of general procedures required to support school learning are found in the programs to develop students' study skills, in writing and reading programs, and in general problem solving (Polya, 1956; Newell and Simon, 1977). Current thinking skills approaches include aspects of this earlier work. Metacognition in more contemporary approaches is extended to include more varied curriculum areas as well as applications to problems that extend beyond standard school subjects. A common concern is the analysis of contemporary media and its effect on thought (Postman, 1985, Greenfield, 1984). Such interests extend metacognitive awareness by including substantive aspects of critical thinking, including logic both formal and informal and the reconstruction of implicit assumptions. Within the new focus on metacognition, students are made aware of more than "executive functions" in information processing. Students are helped to bring to consciousness the covert messages in the arguments they read and to evaluate the presuppositions of the arguments they make. What is most characteristic of recent efforts is this focus on arguments, on bringing to awareness the criteria of rational evaluation, while exposing the stragegies that are used to illicitly support claims (Johnson and Blair, 1983).

Its Place in the School

Once the goals of a thinking skills program have been broadly defined, the next most immediate concern is the relationship of the projected program to the rest of the school day. The place of thinking skills within instruction can be understood within two extremes: separate thinking skills instruction as contrasted with infusion of thinking skills within the course of instruction in the standard school subjects. A word of caution: No matter how deeply infused, thinking skills are a concern that tends to alter instructional practice. Even if taught entirely within the context of ordinary school subjects, the objectives of individual lessons as well as the use of characteristic

pedagogical strategies changes many of the procedures with which school information is produced, transmitted and assessed.

1. Separate thinking skills instruction

One model through which thinking skills instruction and curriculum that support it can be organized requires the relative isolation of such instruction from standard school subjects. Many commercial packages support this model by offering the teacher self-contained materials that require lessons and procedures independent of other instruction (Citron and Glade, 1985). This can reflect no more than the practical contingencies of publication. Publishers develop materials independently of particular instructional commitments and tend to offer for sale complete packages, materials that form a self contained whole. A more theoretical basis for such offerings is the specificity of thinking skills as a domain of concepts and skills. Teachers, rarely trained to have awareness of the specifics of thinking skills, need to have basic thinking concepts and skills identified, both for them and for their students. Once identified, appropriate behaviors need to be acquired and reinforced through appropriate instructional strategies. Special materials developed to do this frequently require a separate focus and are, thus, isolated from other areas of educational concern (Lipman et. al., 1980).

2. Infusion into the normal curriculum

Despite the considerations supporting separate thinking skills instruction, it is generally required that thinking skills and related dispositions be reflected in other school subjects. The attractiveness of thinking as an educational ideal requires that whatever the strategies employed, they have a meaningful effect on the practice of students within all appropriate areas of the curriculum. Thinking, viewed as a general skill and as a desirable disposition, should be expressed wherever the curriculum tends to openness and creativity, wherever autonomy of thought and the evaluation of information is relevant. Separate thinking skills instruction, must therefore, be bridged into the other curriculum areas (Swartz, 1986).

Since such bridging requires that individual teachers translate curriculum packages into procedures relevant to their ordinary instruction, it is maintained by advocates of infusion that staff development address thinking skills by working directly with regular school materials--standard curriculum guides, regularly adopted text books and the like (Perkins, 1986). Such a strategy, although attractive to many educators, requires that teachers be engaged in curriculum development as an ongoing concern. This requires both intensive training in thinking skills theory and practice as well as a professional commitment to the work involved. Given the frequent change of textbooks and their general deficiency in thinking skills activities, teacher curriculum development, cooperative team efforts and turn-key

training all become part of an ongoing effort. Although all of these are highly desirable in themselves, it is not at all clear that they are reasonable expectations in many school settings.

Requirements for Teaching Thinking

Irrespective of the mode of curriculum integration, teaching for thinking requires particular pedagogical approaches and the mastery of essential concepts and skills. The characteristic pedagogical strategies are similar to those that teachers of a progressive bent have always utilized in dealing with open-ended issues. The concepts and skills, on the other hand, require an awareness and knowledge base that has not been common in the training of teachers. They do, however, address aspects of information management and manipulation that are implicit in the repertoire of most adults. The task for teachers is to bring these to self awareness and to help students to identify, understand and apply them to aspects of the curriculum for which they are appropriate.

1. Open-mindedness

The most fundamental of the pedagogical attitudes required for the teaching of thinking is open-mindedness. This ability includes the willingness to take alternative points of view seriously and to structure lessons to permit divergent conceptions to be expressed and supported (Paul, 1986). Teachers who strive to help support the development of higher cognitive skills must design objectives that do not require restricted outcomes. Rather, lessons must have more general goals that can be satisfied in a variety of ways and instantiated in often unexpected conclusions.

2. Flexibility

Flexibility is obviously related to open-mindedness. It is listed separately so that a crucial aspect of teaching for thinking can be emphasized. Thinking lessons require that the teacher follow closely the thread of student discussion, supporting the directions that students find most interesting and productive. This requires that teachers participate actively in the process of the class, thinking ahead as to likely strategies that will guide and reinforce aspects of the discussion that seem most fruitful and conducive to significant analytical thought. In such teaching, objectives that have been defined prior to the lesson frequently require modification in the light of student activities. Although the fundamental goals of a lesson may well remain unchanged, the teacher must be willing to modify both style and content as the thinking lesson progresses. Taking students seriously, giving full attention to their explorations is among the most challenging and difficult aspects of teaching for thinking (Weinstein, 1986).

3. Principles of evaluation

The new interest in thinking skills differs from older approaches in its commitment to objective standards for evaluation. Earlier approaches to thinking skills instruction were frequently relativistic, requiring no more than tolerance of expressed opinions. Many approaches utilized inherently irrational procedures for decision making, voting and taking polls (Raths, et. al. 1967). The approach that is now favored by most theorists relies heavily on standards from logic, formal logic, and most characteristically, what is called informal logic (Nosich, 1982). This latter discipline focuses on the analysis of argument as it occurs in ordinary discourse. The emphasis is on exposing and assessing underlying reasons--theoretic grounds, assumed world views and the like. In addition, this approach is heavily dependent on the traditional analysis of fallacies of reasoning and the procedures that govern rational discourse (Kahane, 1980). Many of these principles and the concepts that they instantiate are unfamiliar to teachers. College instruction before the mid-seventies placed little emphasis on informal logic. It is, therefore, unreasonable to expect teachers to be familiar with such carefully articulated frameworks for evaluating arguments and the positions they support. Informal logic is an area that many teachers have to learn in the structured setting of a university course. Such courses are increasingly available. Teachers who want to teach for thinking are strongly advised to enroll in such courses and to explore the college level texts that present this material.

4. Process management

More familiar to teachers is the aspect of thinking instruction that involves the structuring of classroom exploration of complex issues. Most recent theorists in the thinking skills movement see discussion at the heart of such instruction (Lipman, et. al, 1980). Managing discussions, especially with large classes and with younger students, is a difficult but rewarding task. It is especially difficult given the requirement that criteria for evaluation are to be applied in such discussion. On the contemporary view teachers cannot merely accept all opinions and the arguments that support them as equally sound. Helping students to improve and correct their thinking without inhibiting the creative flow and the imaginative construction of hypotheses and explanations challenges even the most experienced teacher. Nevertheless, it is crucial if discussions that satisfy standards of logical rigor are to be forthcoming.

What is Taught

1. Thinking skills concepts

As mentioned above, the current interest in thinking skills includes an emphasis on logic, both informal and formal. These areas of study, based on the research of philosophers, (Toulmin, 1958) rhetoricians

(Perelman and Olbrechts-Tyteca, 1980) and communication theorists (van Eemeren and Grootendorst, 1984) have deepened and broadened the understanding of the criteria that underlie cogent reasoning. In the earlier grades, teachers must exemplify such procedures both in their modeling of thinking and in the reinforcement of more adequate student behaviors. Many theorists require that these procedures be specifically identified and labeled, making them available to students as part of their metacognitive awareness (Beyer, 1985). This is debatable, especially as seen from within the framework of cognitive developmentalism. Developmentalists maintain that students who have not yet achieved the level of formal operations are not capable of understanding and applying principles of reasoning when presented in the abstract (Fusco, 1985). Nevertheless, abstract principles are implicit in even young children's information processing (Matthews, 1980). Teachers can, therefore, help students to be aware of such underlying abstractions as they are evidenced in the concrete discussion at hand. This is done by selectively reinforcing through emphasis, appropriate reasoning and effective discussion techniques. After the acquisition of formal operations in early adolescence abstract logical concepts can and ought to be taught to facilitate megacognitive awareness and control. Logical principles and the concepts they embody are the most general tools of rational thought. Teaching for thinking includes helping students to become aware of such abstractions and to utilize them throughout their learning.

2. Appropriate procedures and attitudes

Facilitating and reinforcing procedures that support rational discussions are among the most frequent pedagogical objectives advocated by contemporary thinking skills theorists. Students must be helped to identify, internalize and apply the processes that support the reasonable exchange of ideas. Such procedures range from such relatively obvious demands as politeness and willingness to listen, to more substantive concerns. These latter include developing a sense of the criteria governing the appropriateness of particular challenges within a given inquiry, willingness to analyze and clarify issues and a sense of the sort of information that is pertinent to particular disputes. Many of these more sophisticated procedures are dependent on the subject area under discussion, varying widely from context to context (McPeck, 1981). This requires that teachers become familiar with the standards of evaluation that are implicit in the various subject areas. This helps students to appropriately modify their thinking in response to the problem at hand.

How it is Different

It should be apparent from the discussion so far that teaching for thinking skills has a number of aspects that distinguish it from many of the standard instructional strategies utilized in much of education. There are a number of specifiable characteristics that underlie teaching for thinking in contrast to teaching for other kinds of educational objectives.

particularly teaching for mastery of factual content or for mastery of basic skills.

1. Divergent versus convergent thinking

Among the most obvious qualities typifying teaching for thinking is the emphasis on divergent thinking (Meeker, 1969). Divergent thinking is thought of in contrast to the more usual convergent thinking. In convergent thinking students all master the same body of knowledge and demonstrate competence through performing similar procedures expressive of clearly defined skills. Thinking skills instruction, on the contrary, requires that students explore diverse approaches to problems and (even if utilizing common criteria of logical adequacy) reflect these criteria through processes that present opposing viewpoints in a dialectical perspective (Paul, 1985). Equally crucial, the topics appropriate to thinking skills instruction tend to be multi-faceted, requiring complex analysis and permitting many alternative points of view (Paul, 1982). Such "multi-logical" issues invite creative and idiosyncratic responses, permitting a variety of cogent outcomes. The processing of such issues, especially through discussions, also permits latitude in the framing of issues and in the order with which they are approached. Equally plausible sequences for analyzing issues may be generated in the course of the class exploration. Even convergent syntheses may reflect adequate and yet distinctive conceptualizations. Such diversity is at the heart of the creativity that is necessary for truly critical inquiry and no amount of logical rigor necessitates uniqueness of process and uniqueness of outcome.

2. Spiral versus linear instruction

Another fundamental attribute of thinking skills instruction is that the skills and concepts utilized do not fall into a uniquely specifiable hierarchy. Neither do they permit a strictly linear sequence of instruction. Thinking skills overlap and are nested in complex ways. There is no mutually agreed on sequence, either of logical simplicity or for the application of skills in contexts. On the contrary most thinking skills theorists see the skills as mutually supportive and interdependent. This is not inconsistent with a developmental framework although it is clearly inconsistent with narrow pedagogical models that assign particular thinking skills to particular levels of analysis. A more helpful model than that of a linear sequence of thinking skills is that of a spiral. Although mutually dependent and rarely utilizable, or even specifiable in isolation, thinking skills are applied in ever more sophisticated ways and in increasingly complex contexts. Skills like inference, or classifying cannot be taught once and for all. Nor can they be introduced in total independence of each other. Classic Aristotelian inference, for example, is dependent on prior categorization; arguments for appropriate categories of classification invariably require that the consequences of a particular classification be inferentially developed and criticized through

deductive tests. The mutually reinforcing and complementary nature of thinking skills precludes the sort of linear development standardly assumed as appropriate to many basic areas of instruction. Rather, such skills are introduced and reintroduced, looked at again and again in varying contexts and with particular emphases. The development of such skills is not linear, rather it is best seen through the image of the spiral. Each time these skills are reintroduced they are seen with an awareness of their earlier presentation and application. The progress that characterizes increased competence in thinking is reflected in the deepening of understanding of the basic concepts and skills and the application of such skills to ever more complex areas of concern. Like the study of history, viewed as a process that begins in early education, continuing throughout the entire experience, thinking presents much of the same basic themes. Growth is evidenced by increasing sophistication and critical acumen reflected in the way these basic themes are comprehended and applied.

3. Reasoned judgment versus fact and opinion

The fact/opinion dichotomy is one of the most deeply entrenched distinctions in contemporary education of clear relevance to teaching thinking skills. The distinction ramifies throughout instruction and is operationalized in the "politics" of the classroom. Facts are then seen as comprising the domain of instructional prerogative, those areas within which the teacher has complete authority. Opinion, on the other hand, is the area of pupil discretion, the area within which creativity and personality can be safely expressed. Theorists in the thinking skills movement, responding to recent work in epistemology and philosophy of science have argued for the untenability of the distinction, rejecting it as particularly inappropriate within the context of thinking skills instruction. The domain of so called "fact" has been reconceptualized as the temporary stopping place of inquiry, always relative to conceptual history or level of sophistication (Hanson, 1971). Opinion has been denigrated as the merely personal, the idiosyncratic positions that are of no more than biographical interest, those claims that because of triviality and subjectivity are accepted without warrant (Ruggiero, 1984). Thinking skills theorists recommend that claims be seen in terms of a continuum of reasoned judgments (Toulmin et. al., 1979). On such a view what determines the acceptability of a claim is the quality of the reasons available to support it. What have been thought of as facts are at one extreme of the continuum, reasoned judgments so well supported that they are temporarily canonized. Reflecting an informed consensus, facts may be appropriately presented as truths to be accepted as evidence of the mastery of subject matter at a particular point in time. The real nature of such accepted claims, however, is obscured by this expedient. What is considered fact is so considered as a reflection of the stability of the grounds of the assertion. But in principle, the fact-like nature of a claim is dependent on the quality of the support available, dependent on the reasoned judgment that is encapsulated in the "fact." Such a

judgment, like all judgments, is subject to reappraisal. Facts are not the permanent furniture of the world, rather they are the best substantiated claims at agiven time, reflecting the process of inquiry so far. Within educational contexts, claims taken as fact may also be seen as simplifications, reflecting the level of analysis most expedient for the purposes of instruction, or in light of the demands of practical application.

4. Equalizing process versus authoritative source of content

The centrality of reasoned judgment in the teaching of thinking skills replaces the presentation of "facts" with the presentation of arguments. Although arguments frequently include premises based on information accepted through the authority of texts or qualified experts, authority in and of itself does not play a decisive force in the justification of claims. This shifts the locus of instruction from the teacher as transmitter of authoritative information, to the teacher as a qualified (or most qualified) partfcipant in a group inquiry. This implies that even if the teacher is assumed to be the most knowledgeable and most competent of the inquirers, his or her opinions are, in principle, open to challenge. Such challenges require that supporting grounds be given and evaluated. Such a situation extends far beyond the open-minded stance often maintained by progressive teachers. It is more than the willingness of teachers to permit students to correct them when they are "wrong." The primacy of reasoned judgment requires more than that teachers stand open to correction. It requires that teachers, like all others in a discussion, stand open to demands for reasons, willing and capable of offering support for the positions they maintain, aware of the requirement that they change their position when presented with compelling reasons. In this sense thinking skills instruction requires a profound equality among all participants. The authority of the teacher on points at issue is without special force.

5. Community with leader versus separation of pupils and teachers

Although in respect of the point at issue the teacher is, at best, first among equals, the teacher has a very special role to play within the dynamics of classroom instruction (Lipman et. al., 1980). By virtue of special training the teacher reflects the authority of the logical standards that the discussion must satisfy. Therefore, the teacher can make judgments as to the adequacy of arguments presented. Naturally, as the students develop comparable expertise such judgments can be challenged by the students on logical grounds. The teacher is not an infallible judge of the cogency of arguments, but she has an obligation to conduct inquiry within the context of logical standards. As importantly, the dynamics of discussion require that principles of rational discourse be enforced. The teacher must moderate the flow of discussion, requiring that positions be attended to and carefully presented. This

leadership role in the classroom is essential. It must not, however, be confused with the role of the teacher as authority in matters of substance.

The notion of the teacher as facilitator of inquiry presents a peculiar difficulty. The authority of the teacher, categorical in traditional education, enables the student to distance himself from the teacher by thoughtless acceptance of approved views or by equally unsubstantiated rejection. This serves a developmental function, especially in the secondary school, where students' desire for autonomy tends to isolate teachers from students. Within thinking instruction, however, this distance is impossible to sustain. The student must enter into the argument of the teacher and must permit the teacher, as facilitator and as best informed, to comment on student arguments. The role of the teacher in group inquiry is analogous to the role of a coach in sports or of the art or music teacher. Ultimately not responsible for the actual outcome, teachers must play the most intimate role in determining the process. Such a role requires, most of all, trust and mutual respect.

Potential Problem Areas

From what has been said to this point, it is obvious that teaching for thinking places particular demands on the teacher and on the structure and procedures of schools. In the following, we review some of the most fundamental problems that result from these demands.

1. Allocation of class time

The most immediate demand to be addressed when introducing a thinking skills component into the school day is that of time. No matter how deeply integrated into the regular school curriculum, the procedures commonly utilized in thinking skills instruction require that lessons be extended in time. That much is obvious from the mere fact that even correct answers must be explored, defended and subjected to challenge and scrutiny. When thinking is the result of the incorporation of special curricula, the time issue is apparent; teaching additional subject matter requires that time be made available. It is worth repeating that infusing thinking skills instruction into regular school subjects does not solve the problem. The very nature of thinking instruction slows the class process by fostering in-depth analysis and multiple perspective taking. Teaching for thinking takes time.

To the advocate of thinking as a primary goal of education, such an expenditure in time is well worth the resulting gain in the quality of teaching and learning. To pragmatic school personnel the issue might not be as clear. There are a number of strategies that help minimize this tension. The most fundamental is to concede that although all areas of the curriculum are possible candidates for deep analysis and significant inquiry, not everything taught merits such close attention. By carefully choosing aspects of the curriculum through which thinking will be

taught, the additional time that such instruction requires can be factored into the planning of the school day. The use of thinking skills programs is helpful in this regard. By using a separate program, thinking skills can be programmed in a manner that reflects school priorities. This clarifies the issue but by no means resolves it. The need to transfer thinking skills and dispositions into the mainstream of instruction recreates the problem, for however this is done, the pace of instruction will be slower and the total time available in the school day will be affected. What is needed are criteria for choosing aspects of the curriculum that can be justifiably expanded through the infusion of thinking skills procedures.

There are three criteria that seem basic to choosing curriculum areas into which significant thinking activities ought to be infused. These are:

a. Areas of the curriculum that include concepts so fundamental to future learning that the deep internalization that results from thinking skills activities is warranted.

b. Areas of fundamental skills whose application is broad and general. Such skills, for example the construction of analytic essays, or the design of experiments, are both pervasive in future learning and extremely varied in their concrete applications. Teaching such salient forms mechanically and without helping students to see the reasons that underlie the utility of their structure, keeps students from developing the flexibility necessary to apply them in new and unfamiliar ways. To take an example: a common complaint of college faculty is that students cannot write analytical essays. This might seem suprising since instruction in such forms begins in middle school and continues through high school. A plausible explanation of this common inability, is that although students are taught the form of such essays, they are rarely helped to understand how the structure of the analytic essay serves the function for which it has been designed. Thus, when confronted with an analytical task in an unfamiliar or complex area, the student can not apply the essay format to the task at hand.

c. Areas of the curriculum that are of deep significance to students, to the community or to larger society. Problems of social concern, social, political and ethical issues are obvious candidates for in-depth analysis. As we have seen, open-ended and complex issues address a primary goal of thinking skills instruction, the development of thoughtful responses to political and social problems. Such topics, however, have another and equally important role to play. When topics are significant to students the quality of thinking invariably improves. A discussion that "takes off" because of student involvement will manifest the widest variety of skills, and strategies. Such a discussion, if carefully monitored, will afford motivation for later lessons elaborating on skills employed. This generates the development of metacognitive awareness, required for the subsequent reinforcing of appropriate behavior. In addition, the

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experience of being involved in significant discussion builds confidence in both teacher and students, confidence in the meaningfulness and plausibility of teaching for thinking.

2. Modification of classroom strategies

Earlier, when discussing the role of the teacher in teaching for thinking, we emphasized the need for an interactive and supportive posture. Relinquishing the authority of content and exploring all positions advanced, including the teacher's, shifts the nature of the class experience away from traditional instructional modes. Even as basic a device as the lesson plan as standardly conceived, may need to be modified (Hunter, 1983). Clear behavioral objectives, other than those that facilitate inquiry, may be hard to define and summary conclusions may be so vague as to be misleading or unhelpful to the openness of the task. As is obvious by now, the emphasis on class discussion leads to a number of modifications of standard procedures. Discussion itself is relatively rare in classrooms, lecture or directed questioning being the most common mode of interaction (Goodlad, 1983). Discussion creates difficulties for classroom management. These range from the relatively straightforward, rearranging seats so students can easily interact, to extremely difficult issues. The fair allocation of time to speakers, responding to the requirement that many students participate, the role of the teacher as participant as well as discussion leader, are all significant and difficult to accomplish. Even seemingly superficial interruptions of the lesson -- principal's loudspeaker announcements, colleagues requesting materials, students being pulled out for special instruction -- can be disruptive of the fragile group dynamic required for good discussions (Whalley, 1983).

3. Learning new concepts and skills

The incorporation of significant aspects of formal and informal logic into the theoretic basis for thinking skills instruction requires that teachers have more than superficial knowledge of areas most often absent in their education and professional training. This requires that teachers extend their continuing professional development so as to include these central elements. This is frequently more difficult than it might seem, since most available college level instruction in logic is not geared to the needs of teachers or the schools. Even after college courses in logic, teachers will still have to translate new concepts into procedures appropriate to their instructional situation. In addition, leading discussions and facilitating group inquiry are skills in which little or no formal training is available. College teachers who teach logic may be no more sensitive to the need for interactive instruction than their colleagues in other courses. Even informal logic, taught as theory with supporting written practice in most college courses, must be wedded to discussion and other interactive inquiry strategies if it is to play the role required by most theorists in the thinking skills movement. This places

a burden on the schools. Consultants willing to work with teachers in the classroom, modeling by experienced teachers and a supportive school community are all necessary if the difficulties of implementation are to be successfully addressed (Weinstein, et. al., forthcoming).

4. Development and modification of curriculum

Even when schools elect to implement thinking skills instruction through commercially developed curricula, the need to extend skills and procedures into other subject areas demands that teachers engage in modifying existing school curriculum to accommodate the new emphasis (Winocur, 1985). When a direct infusion model is chosen, the development and modification of existing instructional materials is at the heart of the process. The ongoing involvement of teachers with curriculum is thus a hallmark of any serious attempt at integrating thinking skills skills into the schools. Not all teachers are gifted in curriculum development, nor do many teachers have the interest or commitment required for such work. For this reason, schools must identify staff that is capable and willing to accept responsibility for the effort. It is unnecessary for teachers to develop curriculum analogous to professionally produced texts. Rather, teachers may contribute units or even individual lessons. Such a piecemeal approach can result in an ever growing body of available materials, to be shared by all faculty (Weinstein, forthcoming). Such teacher-generated curriculum has the advantage of reflecting first hand knowledge of the curriculum already in use in the school as well as the educational objectives defined by local and state school boards. In addition, a slowly evolving body of teacher-generated materials can be altered as the understanding of the benefits and limits of thinking skills instruction matures.

The effective use of thinking lessons by teachers not involved in their production should be supported by staff development. Such an effort may include the use of outside consultants, in-service training by master teachers and inter-visitations; video tapes of thinking lessons are also helpful. If such an effort is to be effective, the school administration must address the need to compensate master teachers through decreased class load and payments for time spent in curriculum and staff development.

5. Tension between thinking lessons and other instruction

The special nature of thinking skills instruction, supportive, interactive and open, is different from standard instruction in most curriculum areas. In many schools, the instructional norm is transmission of approved information and required skills through direct lecture, convergent questioning and the use of work books (Goodlad, 1983). Although many students have no difficulty in accomodating both of these modes of instruction, there are a number of characteristic student attitudes that reflect tension generated by the novelty of thinking

pedagogy. Students frequently see thinking lessons as play, regular instruction as work. Although this is positive, it may reflect a lack of awareness of the seriousness of group inquiry. Teachers should support students' enjoyment of discussion, but it should be clear to everyone involved that such activities are important and relevant to educational and personal growth (Lipman, et. al., 1980).

Equally common is an undercurrent of frustration. Students often resist participating in activities for which there is no clear cut preferred outcome (Weinstein, 1982). Teachers are often requested to furnish a definitive "answer" when a lesson presents equally supported but incompatible points of view. The need to work within a clearly defined context, where correct answers are available and rewarded, inhibits many students from participating in thinking skills activities. Resistance to the ambiguity that pervades many thinking activities is not limited to underachieving students. It is often the more academically successful students that have difficulty with the open exchange of ideas, their previous school success generating an expectation that their contributions will be rewarded with closure. Conversely, students who are less competent in standard school subjects often discover that thinking skills lessons afford them an arena in which they can compete on a equal basis. Teachers commonly report that thinking skills instruction forces them to alter their prior estimation of individual students. Previously unnoticed strengths become apparent and unexpressed fears and limitations are manifested.

Similar dislocations are experienced by teachers. Many teachers find thinking skills lessons natural, a place where unused competencies can be utilized. Others find such lessons threatening. Discussion management and the need for flexibility and openness are frequently stressful to teachers that have developed successful classroom styles based on more standard pedagogical techniques.

Conclusion

In the foregoing, fundamental issues common to the theory and practice of thinking skills instruction have been raised in summary form. All of the issues raised reflect concerns identified in the literature or commonly expressed by line educators confronting the challenge of integrating thinking into the schools. Although, most of these concerns have been addressed in the growing professional literature and remedies advocated, it is my sense that the uniqueness and complexity of actual school settings precludes the automatic acceptance of any profered solution. The purpose of this summary presentation is to furnish school staff with a schema for organizing their efforts when attempting to integrate thinking skills into the schools. It is my hope that the literature cited in the text,and the analyses and suggestions prompted by my own experiences working with school staff in program development, will offer a platform from which educators can better survey the task. It

is my sincere conviction, however, that no review of the field can be adequate to all of the concrete contexts in which thinking skills integration is to be attempted. . For educators who strive to integrate thinking skills in the schools, there is no alternative to the thoughtful analysis of the actual situation within which they function. Integrating thinking skills into the schools requires, first and foremost, autonomous thinking on the part of the educators who accept responsibility for the task at hand.

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